

CLAIMS

What is claimed is:

- 5 1. A voltage controlled oscillator (VCO) comprising:
 at least one current amplifier for amplifying an input current; and
 a variable resistor capacitor (RC) filter for varying the amount of signal delay in the
VCO.
- 10 2. A VCO as in claim 1, further comprising:
 a filter for removing unwanted signal components from a biasing network.
3. A VCO as in claim 2, wherein the filter is capable of being bypassed using
at least one switch.
- 15 4. A VCO as in claim 1, wherein the variable RC filter includes at least one
 variable capacitor for fine tuning the amount of signal delay in the VCO.
5. A VCO as in claim 1, wherein the variable RC filter includes at least one
20 variable capacitor for coarse tuning the amount of signal delay.
6. A VCO as in claim 1, wherein the RC filter includes a composite voltage
 variable capacitor (VVC) for enabling the RC filter to be finely tuned.
- 25 7. A VCO as in claim 6, wherein the composite VVC utilizes a plurality of
 bias reference voltage and at least one tuning control voltage for adjusting a precise
 capacitance value.
8. A voltage controlled oscillator (VCO) including a current mode delay cell
30 comprising:

a first current amplifier for amplifying an input current;
a resistor capacitor (RC) tuning network for varying the amount of amplification
and delay of an output of the first current amplifier; and
a second current amplifier for amplifying an output current from the RC tuning
5 network.

9. A VCO as in claim 8, wherein the RC tuning network includes at least one
variable resistor for controlling the gain of the first current amplifier and second current
amplifier.

10. A VCO as in claim 8, wherein the RC tuning network includes at least one
variable capacitor for fine tuning the amount of signal delay in the delay cell.

11. A VCO as in claim 8, wherein the RC tuning network includes at least one
15 variable capacitor for coarse tuning the amount of signal delay in the delay cell.

12. A VCO as in claim 8, further comprising at least one filter for providing a
low noise bias voltage from at least one bias supply.

13. A VCO as in claim 12, wherein the at least one filter is capable of being
20 switchably bypassed from at least one bias supply.

14. A VCO as in claim 8, wherein the RC tuning network includes a composite
voltage variable capacitor (VVC) for enabling the RC filter to be finely tuned.

15. A VCO as in claim 14, wherein the composite VVC utilizes a plurality of
bias reference voltage and at least one tuning control voltage for adjusting the capacitance
25 value.

16. A method for providing signal delay in a voltage controlled oscillator (VCO) using a delay cell comprising the steps of:

amplifying an input current with at least one current amplifier; and
5 adjusting the amount of signal delay from the at least one current amplifier using a delay network.

17. A method for providing signal delay in a VCO as in claim 16, wherein the delay network includes at least one variable resistor and at least one variable capacitor for
10 providing adjustable signal delay.

18. A method for providing signal delay in a VCO as in claim 16, wherein the at least one current amplifier includes a first current amplifier at an input of the VCO delay cell and a second current amplifier at an output of the VCO delay cell.
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19. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
providing a bias to the VCO delay cell using a switchable filter that is capable of being bypassed.
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20. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
coarse tuning the amount of signal delay in the VCO delay cell using at least one variable resistor.
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21. A method for providing signal delay in a VCO as in claim 16, further comprising the step of:
fine tuning the amount of signal delay using at least one variable capacitor.

22. A method for providing signal delay as in claim 16, wherein the step of adjusting includes:

5 tuning a resistor capacitor (RC) network using a composite voltage variable capacitor (VVC) for fine tuning the amount of signal delay.

23. A method for providing signal delay as in claim 22, wherein the composite VVC utilizes a plurality of bias reference voltages and at least one tuning control voltage for adjusting the capacitance value.